What is claimed is:

1. A micromirror driver comprising:

a micromirror having at least one groove;

an elastic body which supports the micromirror in rotation; and

at least one electrode which controls the rotation of the micromirror by generating electrostatic forces through interaction between the micromirror and the at least one electrode according to a voltage of the at least one electrode,

wherein an amplitude and a frequency of the rotation of the micromirror are controlled by varying one of a magnitude and a waveform of the voltage of the at least one electrode.

2. The micromirror driver of claim 1, wherein:

the at least one groove is arranged near a rotation axis of the micromirror.

3. The micromirror driver of claim 2, wherein the at least one electrode comprises:

a first electrode which controls the frequency of rotation of the micromirror; and

a second electrode which controls the amplitude of rotation of the micromirror, wherein the second electrode operates independently of the first electrode.

4. The micromirror driver of claim 2, wherein:

the voltage (V) of the at least one electrode satisfies an equation, $V^2=V_0+\alpha\theta$, where:

V_0 represents an initial voltage of the at least one electrode,

α represents an arbitrary coefficient, and

θ represents a rotation angle of the micromirror.

5. The micromirror driver of claim 4, wherein the at least one electrode comprises first and second electrodes and a voltage (V_1) of the first electrode satisfies an equation, $V_1^2=V_0$.

6. The micromirror driver of claim 4, wherein the at least one electrode comprises first and second electrodes and a voltage (V_2) of the second electrode satisfies an equation, $V_2^2=V_0$.

7. The micromirror driver of claim 4, wherein the at least one electrode is formed in a comb shape so that an effective area of the at least one electrode which interacts with the micromirror is maximized.

8. The micromirror driver of claim 4, wherein the at least one electrode comprises first and second electrodes and a voltage (V_2) of the second electrode satisfies an equation, $V_2^2=\alpha\theta$.

9. The micromirror driver of claim 8, wherein the first and second electrodes are formed in a comb shape so that respective first and second effective areas of the first and second electrodes which interact with the micromirror are maximized.

10. The micromirror driver of claim 9, wherein the at least one groove comprises a plurality of grooves which are symmetrically arranged with respect to the rotation axis of the micromirror.

11. The micromirror driver of claim 1, wherein:

the at least one groove comprises a plurality of grooves, symmetrically arranged with respect to a rotation axis of the micromirror; and

the micromirror driver comprises a plurality of electrodes, each electrode disposed in a respective one of the plurality of grooves.

12. The micromirror driver of claim 11, wherein each of the plurality of electrodes is formed in a comb shape so an effective area of each of the plurality of electrodes which interacts with the micromirror is maximized.

13. A micromirror driver comprising:

a micromirror having at least one groove and comprising a base electrode formed at the at least one groove;

an elastic body which supports the micromirror in rotation; and

at least two electrodes which electrostatically interact with the base electrode to rotate the micromirror, wherein one of the at least two electrodes operates independently of another of the at least two electrodes.

14. The micromirror driver of claim 13, wherein each groove is formed at a peripheral portion of the micromirror and arranged near a rotation axis of the micromirror.

15. The micromirror driver of claim 14, wherein the at least two electrodes and the base electrode are formed in a comb shape, and the base electrode is arranged in a gear-like engagement with each of the at least two electrodes so that an effective area of opposing surfaces of each of the at least two electrodes and the base electrode is maximized.

16. The micromirror driver of claim 15, wherein one of the at least two electrodes controls a frequency of the micromirror by varying a waveform of a voltage applied to the one of the at least two electrodes.

17. The micromirror driver of claim 16, wherein another of the at least two electrodes controls an amplitude of the micromirror by varying a magnitude of a voltage applied to the another of the at least two electrodes.

18. The micromirror driver of claim 17, wherein the voltage (V) of the at least two electrodes satisfies an equation, $V^2=V_0+\alpha\theta$ where:

V_0 represents an initial voltage of the at least two electrodes,

α represents an arbitrary coefficient, and

θ represents a rotation angle of the micromirror.

19. The micromirror driver of claim 18, wherein the at least two electrodes comprise an electrode which controls the amplitude of the micromirror in response to a voltage V_1 which satisfies an equation, $V_1^2=V_0$.

20. The micromirror driver of claim 19, wherein:

another of the at least two electrodes controls a resonant frequency of the micromirror in response to a voltage V_2 which satisfies an equation, $V_2^2=\alpha\theta$, and

the resonant frequency of the micromirror is controlled by varying α.

21. The micromirror driver of claim 20, wherein the grooves are symmetrically formed with respect to the rotation axis of the micromirror.

22. The micromirror driver of claim 15, wherein one of the at least two electrodes controls an amplitude of the micromirror by varying a magnitude of a voltage applied to the one of the at least two electrodes.

23. The micromirror driver of claim 22, wherein a voltage (V) of the at least two electrodes satisfies an equation, $V^2=V_0+\alpha\theta$ where:

V_0 represents an initial voltage of the at least two electrodes,

α represents an arbitrary coefficient, and

θ represents a rotation angle of the micromirror.

24. The micromirror driver of claim 23, wherein the at least two electrodes comprise an electrode which controls an amplitude of the micromirror in response to a voltage V_1 which satisfies an equation, $V_1^2=V_0$.

25. A method of controlling a micromirror driver, which comprises a micromirror, an elastic body supporting the micromirror in rotation, and at least one electrode, the method comprising:

generating electrostatic forces between the micromirror and the at least one electrode by applying a voltage V to the at least one electrode;

setting the voltage V to satisfy an equation, $V^2=V_0+\alpha\theta$ where:

V_0 represents an initial voltage of the at least one electrode,

α represents an arbitrary coefficient, and

θ represents a rotation angle of the micromirror; and

controlling a frequency and/or an amplitude of the micromirror by varying the initial voltage V_0 of the at least one electrode and the arbitrary coefficient α.

26. The method of claim 25, wherein:

the at least one electrode comprises a first electrode; and

the method further comprises setting a voltage V_1 of the first electrode to satisfy an equation, $V_1^2=V_0$.

27. The method of claim 26, wherein:

the at least one electrode further comprises a second electrode; and

the method further comprises setting a voltage V_2 of the second electrode to satisfy an equation, $V_2^2=\alpha\theta$.

28. The method of claim 27, wherein:

the setting of the voltage V_1 of the first electrode is independent of the setting of the voltage V_2 of the second electrode.

29. The method of claim 28, wherein the setting of the voltage V_2 of the second electrode controls a resonant frequency f of the micromirror by varying the arbitrary coefficient α in the equation $V^2=\alpha\theta$, wherein the resonant frequency f of the micromirror is expressed by an equation,

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t - \gamma_2\alpha}{I}}$$

wherein:

K_t represents a spring constant of an elastic body which exerts a torque on the micromirror,

I represents an inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of the rotation angle θ of the micromirror.

30. The method of claim 28, wherein the setting of the second voltage V_2 of the second electrode controls a resonant frequency f of the micromirror by varying the arbitrary coefficient α in the equation $V^2=\alpha\theta$, where voltages V1 and V2 are applied to the first and second electrodes, respectively with a phase difference of $\pi/2$, wherein the resonant frequency f of the micromirror is expressed by an equation,

wherein:

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t + \gamma_2\alpha}{I}}$$

K_t represents a spring constant of the elastic body which exerts a torque on the micromirror,

I represents an inertia moment of the micromirror,

γ_2 represents a variation of capacitance with respect to a variation of the rotation angle θ of the micromirror.

31. The method of claim 25, wherein:

the at least one electrode comprises a second electrode; and

the setting of the voltage V further comprises setting a voltage V_2 of the second electrode to satisfy an equation, $V_2^2=\alpha\theta$.

32. The method of claim 31, wherein the first and second electrodes operate independently of each other.

33. The method of claim 32, wherein the second electrode controls the resonant frequency f of the micromirror by varying the arbitrary coefficient α in the equation $V^2=\alpha\theta$, wherein the resonant frequency f of the micromirror is expressed by an equation,

wherein:

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t - \gamma_2\alpha}{I}}$$

K_t represents the spring constant of the elastic body,

I represents an inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of the rotation angle θ of the micromirror.

34. The method of claim 32, wherein the second electrode controls the resonant frequency f of the micromirror by controlling the arbitrary coefficient α in the equation $V^2=\alpha\theta$, and in a case where respective voltages with a phase difference of $\pi/2$ are applied to the first and second electrodes, the resonant frequency f of the micromirror is expressed by an equation,

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t + \gamma_2\alpha}{I}}$$

wherein:

K_t represents a spring constant of the elastic body,

I represents the inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of the rotation angle θ of the micromirror.

35. A method of controlling a micromirror driver, which comprises a micromirror, an elastic body supporting the micromirror in rotation, and at least one electrode which controls the rotation of the micromirror by generating electrostatic interaction between the micromirror and the at least one electrode according to a driving voltage, the method comprising:

controlling a resonant frequency of the micromirror by varying a waveform of the driving voltage of the at least one electrode.

36. The method of claim 35, further comprising:

controlling an amplitude of the micromirror by varying a magnitude of the driving voltage of the at least one electrode.

37. The method of claim 36, wherein:

the at least one electrode comprises a first electrode; and

the method further comprises setting a voltage (V_1) of the first electrode to satisfy an equation, $V_1^2=V_0$ where V_0 represents an initial voltage of the at least one electrode.

38. The method of claim 37, wherein:

the at least one electrode further comprises a second electrode; and

the method further comprises setting a voltage (V_2) of the second electrode to satisfy an equation, $V_2^2=\alpha\theta$ where α represents an arbitrary coefficient and θ represents a rotation angle of the micromirror.

39. The method of claim 38, wherein:

the setting of the voltage V_1 at the first electrode is independent of the setting of the voltage V_2 at the second electrode.

40. The method of claim 39, wherein:

the setting of the voltage V_2 at the second electrode controls a resonant frequency f of the micromirror by controlling an arbitrary coefficient α in the equation, $V^2=\alpha\theta$, wherein the resonant frequency f of the micromirror is expressed by an equation,

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t - \gamma_2\alpha}{I}}$$

wherein:

K_t represents a spring constant of the elastic body,

I represents an inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of a rotation angle θ of the micromirror.

41. The method of claim 39, wherein:

the setting of the voltage V_2 at the second electrode controls a resonant frequency f of the micromirror by controlling an arbitrary coefficient α in the equation, $V_2^2=\alpha\theta$, and in a case where respective voltages with a phase difference of $\pi/2$ are applied to the first and second electrodes, the resonant frequency f of the micromirror is expressed by an equation,

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t + \gamma_2\alpha}{I}}$$

wherein:

K_t represents a spring constant of the elastic body,

I represents an inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of a rotation angle θ of the micromirror.

42. The method of claim 36, wherein:

the at least one electrode comprises at least one second electrode; and

the method further comprises setting the voltage V_2 to satisfy an equation, $V_2^2=\alpha\theta$.

43. The method of claim 42, wherein the setting of the voltage V_1 at the first electrode is independent of the setting of the voltage V_2 at the second electrode.

44. The method of claim 43, wherein the setting of the voltage V_2 at the second electrode controls a resonant frequency f of the micromirror by controlling an arbitrary coefficient α in the equation, $V_2^2=\alpha\theta$, and the resonant frequency f of the micromirror is expressed by an equation,

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t - \gamma_2\alpha}{I}}$$

wherein:

K_t represents a spring constant of the elastic body,

I represents an inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of a rotation angle θ of the micromirror.

45. The method of claim 43, wherein the setting of the voltage V_2 at the second electrode controls a resonant frequency f of the micromirror by controlling an arbitrary coefficient α in the equation, $V_2^2=\alpha\theta$, and in a case where respective voltages with a phase difference of $\pi/2$ are applied to the first and second electrodes, a resonant frequency f of the micromirror is expressed by an equation,

$$f = \frac{1}{2\pi}\sqrt{\frac{K_t + \gamma_2\alpha}{I}}$$

wherein:

K_t represents a spring constant of the elastic body,

I represents an inertia moment of the micromirror, and

γ_2 represents a variation of capacitance with respect to a variation of a rotation angle θ of the micromirror.

46. A micromirror driver comprising:

a micromirror having an outer edge and a rotation axis, the micromirror comprising:

a base electrode having a first portion formed along the outer edge of the micromirror, and a second portion formed between the outer edge of the micromirror and the rotation axis;

an elastic body which supports the micromirror for rotation about the rotation axis; and

first and second driver electrodes which electrostatically interact with the first and second portions of the base electrode, respectively, in response to an applied voltage.

47. The micromirror driver of claim 46, wherein the micromirror has a groove and the second portion of the base electrode is formed in the groove.

48. The micromirror driver of claim 47, wherein the second portion of the base electrode is formed at a sidewall of the groove and the second driver electrode is formed adjacent the sidewall.

49. The micromirror driver of claim 46, wherein:

the second portion of the base electrode and the second driver electrode are comb shaped and arranged in a gear like engagement.

50. The micromirror driver of claim 47, wherein the second portion of the base electrode and the second driver electrode are comb shaped and arranged in a gear like engagement.

51. The micromirror driver of claim 46, wherein the first portion of the base electrode and the first driver electrode are comb shaped and arranged in a gear like engagement.

52. The micromirror driver of claim 47, wherein the first portion of the base electrode and the first driver electrode are comb shaped and oppositely in a gear like engagement.

53. A method of controlling a micromirror which is suspended for rotation about an axis by an elastic body, the micromirror having a base electrode, a first portion of the base electrode formed along an edge of the micromirror and a second portion of the base electrode formed between the first portion of the base electrode and the rotation axis, and the micromirror driver having first and second driver electrodes disposed near the first and second portions of the base electrode, respectively, the method comprising:

applying a voltage (V_1) to the first driver electrode wherein V_1 satisfies an equation, $V_1^2 = V_0$, to control an amplitude of the micromirror; and

applying a voltage (V_2) to the second driver electrode wherein V_2 satisfies an equation, $V_2^2 = \alpha\theta$, and adjusting α to control a frequency of the micromirror, wherein:

V_0 represents an initial voltage at the electrodes, and

θ represents a rotation angle of the micromirror.

54. The method of claim 52, wherein V_1 and V_2 have a phase difference of $\pi/2$.

55. A micromirror driver, comprising:

a micromirror having an outer edge and a rotation axis, the micromirror comprising:

a base electrode having a first portion formed along the outer edge of the micromirror and a second portion formed between the outer edge of the micromirror and the rotation axis;

an elastic body which supports the micromirror for rotation about the rotation axis; and

first and second driver electrodes which electrostatically interact with the first and second portions of the base electrode, respectively, in response to first and second applied voltages, respectively, wherein:

the first voltage controls an amplitude of the micromirror; and

the second voltage controls a resonant frequency of the micromirror.

56. The micromirror driver of claim 55, wherein the second voltage controls the resonant frequency independently of the control of the amplitude by the first voltage.

57. The micromirror driver of claim 56, wherein the second voltage controls the resonant frequency simultaneously with the control of the amplitude by the first voltage.

58. The micromirror driver of claim 56, wherein the second voltage controls the resonant frequency independently of and simultaneously with the control of the amplitude by the first voltage.